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Determination of tetracycline antibiotics using the electrocatalytic response of an electrode modified by a mixed-valence ruthenium oxide-ruthenium cyanide film

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Abstract

It is established that mixed-valence ruthenium oxide-ruthenium cyanide deposited on a glassy carbon electrode surface possesses catalytic activity for oxidation of tetracycline antibiotics (tetracycline, oxytetracycline, doxycycline). The catalytic effect consists of a decrease in the potential of tetracycline oxidation by about 200 mV and in a multiple increase of the oxidation current. A method is proposed for determining tetracycline, oxytetracycline, and doxycycline using the electrocatalytic response of a chemically modified electrode with a RuO-RuCN film under batch and flow-injection analysis conditions. The catalytic current depends linearly on the concentration of tetracycline antibiotics from 5 mM to 0.5 μM and 50 nM under batch and flow-injection analysis conditions, respectively. © 2008 Springer Science+Business Media, Inc.

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